

Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently amended) A diagnostic method comprising the steps of:
 - (a) examining an *in-vivo* tissue sample using an optical signal detection system adapted to automatically assign a classification to each of a plurality of regions of the tissue sample, wherein the classifications assigned to the regions of the tissue sample comprise at least one of the categories selected from the group consisting of necrotic, CIN 2/3, NED, and indeterminate;
 - (b) creating an overlay map visually indicating the classifications assigned to the regions of the tissue sample; and
 - (c) displaying the overlay map to facilitate identification of suspect portions of the tissue sample.
2. (Original) The method of claim 1, wherein step (c) comprises superimposing the overlay map onto an image of the tissue sample.
3. (Original) The method of claim 2, wherein the image of the tissue sample is a reference image.
4. (Original) The method of claim 3, wherein the tissue sample comprises cervical tissue and the reference image is a colposcopic image.
5. (Original) The method of claim 2, wherein step (c) comprises displaying the overlay map superimposed onto a real-time colposcopic image of the tissue sample.
6. (Original) The method of claim 1, wherein step (c) comprises projecting the overlay map onto the tissue sample.
7. (Original) The method of claim 1, wherein steps (a) through (c) are performed during the course of a single patient visit.

8. (Original) The method of claim 1, wherein the displaying step is performed substantially contemporaneously with the examining step.
9. (Original) The method of claim 1, wherein the classification in step (a) comprises a tissue-class probability.
10. (Cancelled)
11. (Original) The method of claim 1, further comprising the steps of:
 - (d) identifying at least one suspect portion of the tissue sample; and
 - (e) marking the at least one suspect portion.
12. (Original) The method of claim 11, wherein step (e) comprises marking the at least one suspect portion using at least one of an endogenous agent and an exogenous agent.
13. (Original) The method of claim 11, wherein step (e) comprises marking at least one suspect portion using at least one of a photobleaching technique and a photoactivation technique.
14. (Original) The method of claim 11, wherein step (e) comprises marking the at least one suspect region for follow-up examination.
15. (Original) The method of claim 11, wherein step (e) comprises marking the at least one suspect region for treatment.
16. (Original) The method of claim 11, wherein steps (a) through (e) are performed during a single patient visit.
17. (Original) The method of claim 1, further comprising the steps of:
 - (d) identifying at least one suspect portion of the tissue sample; and
 - (e) excising tissue from the at least one suspect portion for biopsy.
18. (Original) The method of claim 1, further comprising the steps of:
 - (d) identifying at least one suspect portion of the tissue sample; and
 - (e) treating the at least one suspect portion.

19. (Original) The method of claim 18, wherein step (e) comprises performing at least one of: photodynamic therapy, cryotherapy, and direct chemical treatment.
20. (Original) The method of claim 18, wherein step (e) comprises performing photodynamic therapy using at least one photosensitive agent.
21. (Original) The method of claim 20, wherein the at least one photosensitive agent comprises at least one of an exogenous agent and an endogenous agent.
22. (Original) The method of claim 20, wherein the at least one photosensitive agent comprises at least one of a hematoporphyrin, a phthalocyanine, and a chlorin.
23. (Original) The method of claim 20, wherein the at least one photosensitive agent comprises at least one of dihematoporphyrin, 5-aminolevulinic acid, protoporphyrin IX, temoporfin, and meso-tetrahydroxyphenylchlorin.
24. (Original) The method of claim 18, wherein step (e) comprises removing tissue from the at least one suspect portion using laser ablation.
25. (Original) The method of claim 18, wherein steps (a) through (e) are performed during a single patient visit.
- 26–51. (Cancelled)
52. (Currently Amended) A method for identifying a characteristic of each of a plurality of regions of a tissue sample, the method comprising the steps of:
 - (a) obtaining at least one optical signal from each of a plurality of regions of a tissue sample following application of a contrast agent and at least one of an optical probe and a biological-responsive probe to the tissue sample; and
 - (b) automatically identifying a characteristic of each of the plurality of regions based at least in part on the at least one optical signal,

wherein step (a) comprises applying at least one of an optical probe and a biological-responsive probe to the tissue sample in order to detect at least one member selected from the group consisting of collagen, porphyrin, FAD, and NADH.

53. (Currently Amended) The method of claim 52, wherein step (a) comprises applying the optical probe comprises a spectroscopic enhancer to the tissue sample.

54. (Currently Amended) The method of claim 52, wherein step (a) comprises applying the biological-responsive probe comprises telomerase to the tissue sample.

55. (Cancelled)

56. (Currently Amended) The method of claim 52, further comprising the steps of:
(e)(c) creating an overlay map visually indicating the characteristics identified in step (b)(d);
and
(f)(d) displaying the overlay map to facilitate identification of suspect portions of the tissue sample.

57. (Original) The method of claim 52, wherein the at least one optical signal comprises a fluorescence spectrum and at least one reflectance spectrum, and wherein step (b) comprises identifying a characteristic of a subset of the plurality of regions based at least in part on a fluorescent biomarker signal.

58. (New) The method of claim 1, wherein the tissue sample comprises epithelial cells.

59. (New) The method of claim 52, wherein the tissue sample comprises epithelial cells.

60. (New) The method of claim 52, wherein the tissue sample comprises cervical tissue.

61. (New) A system for detection of suspect portions of a tissue sample, the system comprising:

- (a) an optical signal detection apparatus adapted to obtain at least one optical signal from each of a plurality of regions of a tissue sample;
- (b) a memory that stores code defining a set of instructions;

- (c) a processor that executes the instructions thereby to:
 - (i) assign a classification to each of a plurality of regions of the tissue sample based at least in part on the at least one optical signal, wherein the classifications assigned to the regions of the tissue sample comprise at least one of the categories selected from the group consisting of necrotic, CIN 2/3, NED, and indeterminate; and
 - (ii) create an overlay map visually indicating the classifications assigned to the regions of the tissue sample; and
- (d) a display for facilitating identification of suspect portions of the tissue sample according to the overlay map.